

FORM PTO-1390
(REV. 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER
LEN-021020

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/088573

INTERNATIONAL APPLICATION NO.
PCT/EP00/09037

INTERNATIONAL FILING DATE
9/15/2000

PRIORITY DATE CLAIMED
9/21/1999

TITLE OF INVENTION ELECTROMAGNETIC ACTUATOR

APPLICANT(S) FOR DO/EO/US Heinz Leiber, and Thomas Leiber

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371 (f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (**Unsigned)
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☒ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information: English translation of the International Preliminary Examination Report; Return Postcard; and Certificate of Mailing by Express Mail

U.S. APPLICATION NO. (if known) 10/088573 INTERNATIONAL APPLICATION NO. PCT/EP00/09037		ATTORNEY'S DOCKET NUMBER LEN-021020	
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21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: right;">\$890.00</td> <td style="width:50%;"></td> </tr> <tr> <td style="text-align: right;">\$130.00</td> <td></td> </tr> </table>		\$890.00		\$130.00	
\$890.00									
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Surcharge of \$130.00 for furnishing the oath or declaration later than <input checked="" type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).									
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$					
Total claims	9 - 20 =	0	x \$18.00	\$0.00					
Independent claims	1 - 3 =	0	x \$84.00	\$0.00					
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$280.00					
TOTAL OF ABOVE CALCULATIONS =				\$1,020.00					
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$0.00					
SUBTOTAL =				\$1,020.00					
Processing fee of \$130.00 for furnishing the English translation later than <input checked="" type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$130.00					
TOTAL NATIONAL FEE =				\$1,150.00					
Fee for recording the enclosed assignment (37 CFR 1.21 (h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$0.00					
TOTAL FEES ENCLOSED =				\$1,150.00					
				Amount to be refunded: \$					
				charged: \$					

a. ☒ A check in the amount of \$ 1,150.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

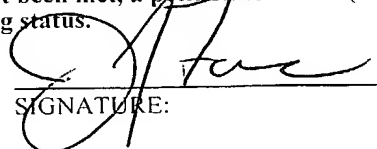
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d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

FACTOR & PARTNERS, LLC
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 Chicago, IL 60607
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 SIGNATURE:
 Jody L. Factor
 NAME
 34157
 REGISTRATION NUMBER

10/088573

10/088573

JC10 Rec'd PCT/PTO 19 MAR 2002

IN THE
UNITED STATES
PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Leiber, et al.

CASE: LEN-021020

PRELIMINARY
AMENDMENT

SERIAL NO.: To be assigned

FILED ON: March 21, 2002

FOR: ELECTROMAGNETIC
ACTUATOR

ASSISTANT COMMISSIONER
FOR PATENTS
Washington DC 20231

ATTENTION OF:

EXAMINER:

Dear Sir:

If any charges or fees must be paid in connection with the following communication, they may be paid out of our Deposit Account No. 50-0545.

Please enter the foregoing preliminary amendment **PRIOR** to calculation of filing fees and substantive examination of the claims.

FACTOR & PARTNERS, LLC
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Jody L. Factor

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10/088573

JC10 Rec'd PCT/PTO 19 MAR 2002

IN THE CLAIMS AMEND

1. Electromagnetic actuator for actuating a gas exchange valve [(10)] having an electromagnet [(1)] for closing the gas exchange valve (closing magnet) and an electromagnet [(2)] for opening the gas exchange valve (opening magnet), having a corresponding armature [(3)] actuating the gas exchange valve [(1)] and with oppositely directed spring forces [(6, 9)] acting on the armature [(3)], which set the armature [(3)] in an intermediate position between two end positions without actuating an electromagnet [(1, 2)], wherein the armature [(3)] is at least kept in the vicinity of the poles [(2c)] of the electromagnets [(1,2)] by means of the electromagnets [(1,2)], wherein the armature [(3)] is pivotably supported around a pivoting axis [(4)] and wherein the distance of the actuation point onto the gas exchange valve from the pivoting axis [(4)] is larger than the distance of the center of the armature from the pivoting axis [(4)] (transmission ratio $I_2/I_1 < 1$), characterized in that,
 - the armature [(3)] is formed in such a way, that the center [(middle 3b)] of the armature portion arranged opposite to the opening magnet [(2)], lies closer to the pivoting axis [(4)] than the center [(middle 3b)] of the armature portion arranged to the closing magnet [(1)] and that the poles [(1c, 2c)] of the electromagnets [(1, 2)] are arranged to lie opposite to these armature portions.
2. Electromagnetic actuator according to claim 1, characterized in that

at least one of the armature portions is formed as an immersion armature with immersing armature portions [(13a, 13b)].

3. Electromagnetic actuator according to claim 1 [or 2] characterized in that the armature portion arranged to the opening magnet [(12)] is formed as an immersion armature [(13a, 13b)] and that the armature portions [(13a, 13b)] immersing in the electromagnets [(12)] lie closer to the pivoting axis [(4)] than the pole ends [(12c)] of the yoke [(12a)] of the electromagnet [(12)] arranged to these immersing armature portions [(13a, 13b)].
4. Electromagnetic actuator according to [one of the claims 1 to 3] claim 1, characterized in that a flat armature [(3)] is arranged to the closing magnet [(1)] or in that the closing magnet [(1)] comprises a flat armature.
5. Electromagnetic actuator according to [one of claims 1 to 4] claim 1, characterized in that at least one rolling member bearing [(15)] is provided for the pivotable support.
6. Electromagnetic actuator according to [one of claims 1 to 5] claim 1, characterized in that the armature [(3)] and/or the yokes [(1a, 2a)] are formed from stamped parts.

- *****
7. Electromagnetic actuator according to [one of claims 1 to 6] claim 1,
characterized in that
the yokes [(1a, 2a)] are adjustable relative to the armature [(3)].
 8. Electromagnetic actuator according to [one of claims 1 to 7] claim 1,
characterized in that
the electromagnets [(1, 2)] have the form of an E or E/U.
 9. Electromagnetic actuator according to [one of claims 1 to 8] claim 1,
characterized in that
the electromagnet for opening the gas exchange valve is two-poled.

REMARKS

Applicant respectfully submits that all amendments were made solely for conformance with U.S. practice, namely the removal of reference numbers and to remove multiple dependencies. All such changes have been made prior to substantive U.S. Examination and not in view of any prior art.

Upon entry of the foregoing, the application is in condition for substantive examination at the present time.

SECRET


Jody L. Factor
One of Attorneys for Applicant

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One of Attorneys for Applicant

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(81) Designated States (national): JP, US.

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For explanation of the two-letter code and the other abbreviations it is referred to the explanation ("Guidance Notes on Codes and Abbreviations") at the beginning of each regular issue of the PCT-Gazette.

(54) Title: ELECTROMAGNETIC ACUTATOR

(57) Abstract: The invention relates to an electromagnetic actuator which actuates a gas exchange valve. Said actuator comprises two electromagnets and an armature which is actuated by the latter and acts upon the gas exchange valve and comprises two spring forces which act in opposing directions upon the armature. The electromagnets have a transformation ratio $i = I_1 / I_2$ of less than 1. The armature and the poles of the electromagnet which are assigned thereto are configured in such a way that the transformation ratio i_1 of the contact magnet is greater than the transformation ratio i_2 of the break magnet.

Electromagnetic actuator

The invention relates to an electromagnetic actuator with the features of the State of the Art part of claim 1.

Such an actuator is for example described in the older Patent Application 19824 537.8.

The transmission ratio i for both electromagnets is normally the same.

The invention has the object to further improve the proposed actuator.

This object is solved by means of the features of claim 1.

For the closing magnet it is valid, that it has to have a large retaining force because of the valve closing force. On the other hand the closing magnet has to carry out a relative small lifting work because of the smaller gas forces during the closing.

Compared to this the opening magnet has to carry out a relative large lifting work because of the relative large gas forces at the outlet valve. To save energy, thus, the operating air gap should be as small as possible, which necessitates a smaller transmission ratio i for the opening magnet.

Contrary to this the closing magnet produces a higher force on the valve axle at a higher transmission ratio.

From these considerations the layout of the actuator with different i for the two electromagnets results.

With this layout of the electromagnets the closing magnet becomes small. The effective armature inertia is slightly increased because of the shape of the armature (e.g. trapezoidal cross-section).

The opening magnet has a small average air gap, which reduces the efficiency.

According to an improvement of the invention at least one of the magnets is formed as a characteristic line magnet. With this, it has to be taken care of, that the dimensioning rule of claim 1 is obeyed to. Preferably, the opening magnet is formed as a two-pole immersion armature, wherein the armature portion arranged opposite to the opening magnet is formed in such a way, that the armature portions immersing into the electromagnet are arranged closer to the swivelling axis than the pole ends of the yoke arranged to the immersing armature portions.

The use of such a characteristic line magnet as the opening magnet is known from EP 0739 004 A1. Compared to the second electromagnet the armature is formed as a flat armature. The electromagnets are there formed as pot magnets, wherein the armature carries out a linear up- and downwards movement. In the State of the Art the armature is glidingly supported. The air gap differences unavoidable because of the manufacturing tolerances produce relative high transversal forces, whereby frictional forces are caused. The use of a characteristic line magnet has the advantage, that the high gas forces can be easier balanced because of the higher far field-force of such an electromagnet. In the specific case of the pivotable armature the moved mass of the armature and therewith the energy requirement is kept small by the invention. The use of a single or several rolling bearings for the pivoting movement of the armature has the advantage, that transversal forces on the bearing caused by the manufacturing tolerances produce lower frictional losses. Because of the use of stamped parts for the armature and/or the yoke, which can be manufactured as fine stamping parts, the tolerances and the eddy current losses can be kept small. Furthermore, the yoke can be adjusted relative to the armature. The use of the characteristic line magnets formed according to the invention is also possible without the use of the features of A1 .

Embodiments of the invention are described by reference to the drawing.

Fig. 1 shows a first embodiment.

Fig. 2 shows a second embodiment.

In Fig. 1 two two-pole electromagnets 1 and 2 are shown, which, respectively, have a yoke 1a or 2a and a winding 1b or 2b. An armature 3 arranged to these electromagnets 1 and 2 is attached on a lever, which is pivotably supported on its left end. The support can be formed as rolling member bearings, wherein one or more rolling member bearings can be used. The spring forces acting on the armature 3 are, in this case, produced by a torsion bar, e.g. torsion bar or torsion tube 6, as well as by the valve spring 9. The torsion bar extends in the direction of the pivoting axis and at least partially in a tube 7, which is formed by the lever 8. On the other end of the lever 8, the lever acts on a valve stem 10, only schematically represented, onto which the force of the valve spring 9 acts.

The electromagnet 2 is the opening magnet.

Here, the shaded represented armature 3 has in the cross-section the form of a trapezoid with not parallel side faces. Therefore, the centre 2b of the lower armature portion lies closer to the pivoting axis 4 than the centre 3a of the upper armature portion. The poles of the electromagnets are arranged in such a way, that they are arranged to the armature portions with the centres 3a and 3b. From this results, that the transmission ratio i_1 of the electromagnet 1 is larger than the transmission ratio i_2 of the electromagnet 2. Alternatively, the armature can also have the form of a rhombus or of a polygon.

In Fig. 2, similar as in Fig. 1, two electromagnets 11, 11a, 11b and 12, 12a and 12b are provided, to which a pivotably supported armature 12 is opposed, which acts onto a valve stem 20. Here, the lever 18 is supported in rolling member bearings 15. In this case, the torsion bar 16 produces the total spring forces. Here, it is also valid, that is $i_1 > i_2$.

While the portion of the armature 13, arranged to the electromagnet 11, is a flat armature, the armature portion arranged to the electromagnet 12 is formed in this case, additionally as an immersion armature with immersion portions 13a and 13b and the poles 12c of the yoke 12a are arranged close to the immersion portions 13a and 13b in the shown position and is formed suitable for the pivoting movement, so that small air gaps are formed. As mentioned, the armature 13 and the yokes 11a and 12a

are preferably assembled from stamping parts, thus, they are laminated. Because of the rolling bearing arrangement and the yokes adjustable relative to the armature the radial air gaps can be kept very small. The system acts, in this case like a reluctance motor.

The yokes of the magnets 1 and 2 are formed as U-magnets in Figures 1 and 2. They also can be formed as E-magnets or E/U-magnets.

Claims

- 1.) Electromagnetic actuator for actuating a gas exchange valve (10) having an electromagnet (1) for closing the gas exchange valve (closing magnet) and an electromagnet (2) for opening the gas exchange valve (opening magnet), having a corresponding armature (3) actuating the gas exchange valve (1) and with oppositely directed spring forces (6, 9) acting on the armature (3), which set the armature (3) in an intermediate position between two end positions without actuating an electromagnet (1, 2), wherein the armature (3) is at least kept in the vicinity of the poles (2c) of the electromagnets (1, 2) by means of the electromagnets (1, 2), wherein the armature (3) is pivotably supported around a pivoting axis (4) and wherein the distance l_1 of the actuation point onto the gas exchange valve from the pivoting axis (4) is larger than the distance l_2 of the centre of the armature from the pivoting axis (4) (transmission ratio $i = l_2/l_1 < 1$), characterised in that
the armature (3) is formed in such a way, that the centre (middle 3b) of the armature portion arranged opposite to the opening magnet (2), lies closer to the pivoting axis (4) than the centre (middle 3a) of the armature portion arranged to the closing magnet (1) and that the poles (1c, 2c) of the electromagnets (1, 2) are arranged to lie opposite to these armature portions.
- 2.) Electromagnetic actuator according to claim 1,
characterised in that
at least one of the armature portions is formed as an immersion armature with immersing armature portions (13a, 13b).
- 3.) Electromagnetic actuator according to claim 1 or 2,
characterised in that
the armature portion arranged to the opening magnet (12) is formed as an immersion armature (13a, 13b) and that the armature portions (13a, 13b) immersing in the electromagnets (12) lie closer to the pivoting axis (4) than

the pole ends (12c) of the yoke (12a) of the electromagnet (12) arranged to these immersing armature portions (13a, 13b).

- 4.) Electromagnetic actuator according to one of the claims 1 to 3,
characterised in that
a flat armature (3) is arranged to the closing magnet (1) or in that the closing magnet (1) comprises a flat armature.
- 5.) Electromagnetic actuator according to one of the claims 1 to 4,
characterised in that
at least one rolling member bearing (15) is provided for the pivotable support.
- 6.) Electromagnetic actuator according to one of claims 1 to 5,
characterised in that
the armature (3) and/or the yokes (1a, 2a) are formed from stamped parts.
- 7.) Electromagnetic actuator according to one of claims 1 to 6,
characterised in that
the yokes (1a, 2a) are adjustable relative to the armature (3).
- 8.) Electromagnetic actuator according to one of claims 1 to 7,
characterised in that



- [REDACTED]

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTVEREINS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
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F01L 9/04

Strasse 34, 71739 Oberriexingen (DE). **LEIBER, Thomas**
[DE/DE]; Gentzstrasse 1/5, 80796 München (DE).

(21) Internationales Aktenzeichen: **PCT/EP00/09037**

(74) Anwalt: **LENZING, Andreas**; Münsterstr. 248, 40470
Düsseldorf (DE).

(22) Internationales Anmeldedatum:
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(81) Bestimmungsstaaten (*national*): JP, US.

(25) Einreichungssprache: **Deutsch**

(84) Bestimmungsstaaten (*regional*): europäisches Patent (AT,
BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,
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(26) Veröffentlichungssprache: **Deutsch**

Veröffentlicht:

— Mit internationalem Recherchenbericht.

(30) Angaben zur Priorität:
199 45 112.5 21. September 1999 (21.09.1999) **DE**

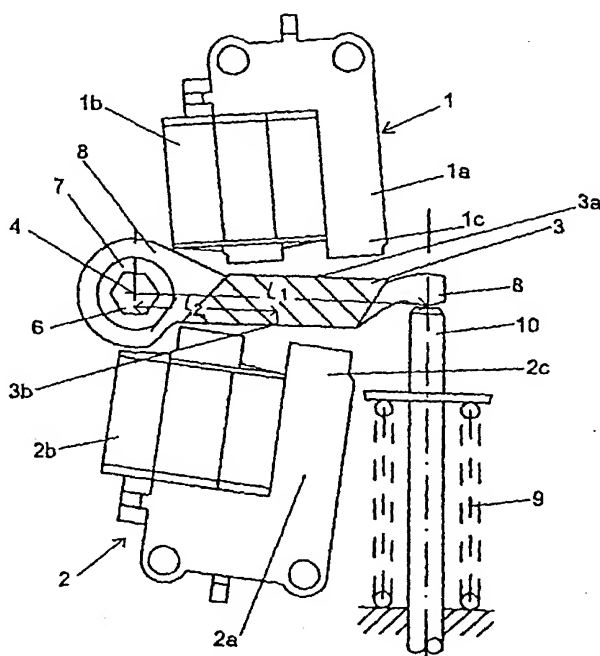
Zur Erklärung der Zweibuchstaben-Codes, und der anderen
Abkürzungen wird auf die Erklärungen ("Guidance Notes on
Codes and Abbreviations") am Anfang jeder regulären Ausgabe
der PCT-Gazette verwiesen.

(71) Anmelder und

(72) Erfinder: **LEIBER, Heinz** [DE/DE]; Theodor-Heuss-

(54) Title: **ELECTROMAGNETIC ACTUATOR**

(54) Bezeichnung: **ELEKTROMAGNETISCHER AKTUATOR**



(57) Abstract: The invention relates to an electromagnetic actuator which actuates a gas exchange valve. Said actuator comprises two electromagnets and an armature which is actuated by the latter and acts upon the gas exchange valve and comprises two spring forces which act in opposing directions upon the armature. The electromagnets have a transformation ratio $i = I_1/I_2$ of less than 1. The armature and the poles of the electromagnet which are assigned thereto are configured in such a way that the transformation ratio i_1 of the contact magnet is greater than the transformation ratio i_2 of the break magnet.

(57) Zusammenfassung: Es wird ein elektromagnetischer Aktuator beschrieben, der zur Betätigung eines Gaswechselventils dient. Er besteht aus zwei Elektromagneten und einem von diesen betätigten Anker, der auf das Gaswechselventil einwirkt und aus zwei Federkräften, die gegengerichtet auf den Anker wirken. Die Elektromagnete weisen ein Übersetzungsverhältnis $i = I_1/I_2$ kleiner 1 auf. Der Anker und die ihm zugeordneten Pole des Elektromagneten sind nun derart ausgebildet, dass das Übersetzungsverhältnis i_1 des Schliessmagneten grösser als das Übersetzungsverhältnis i_2 des Öffnungsmagneten ist.

WO 01/22442 A1

1/2

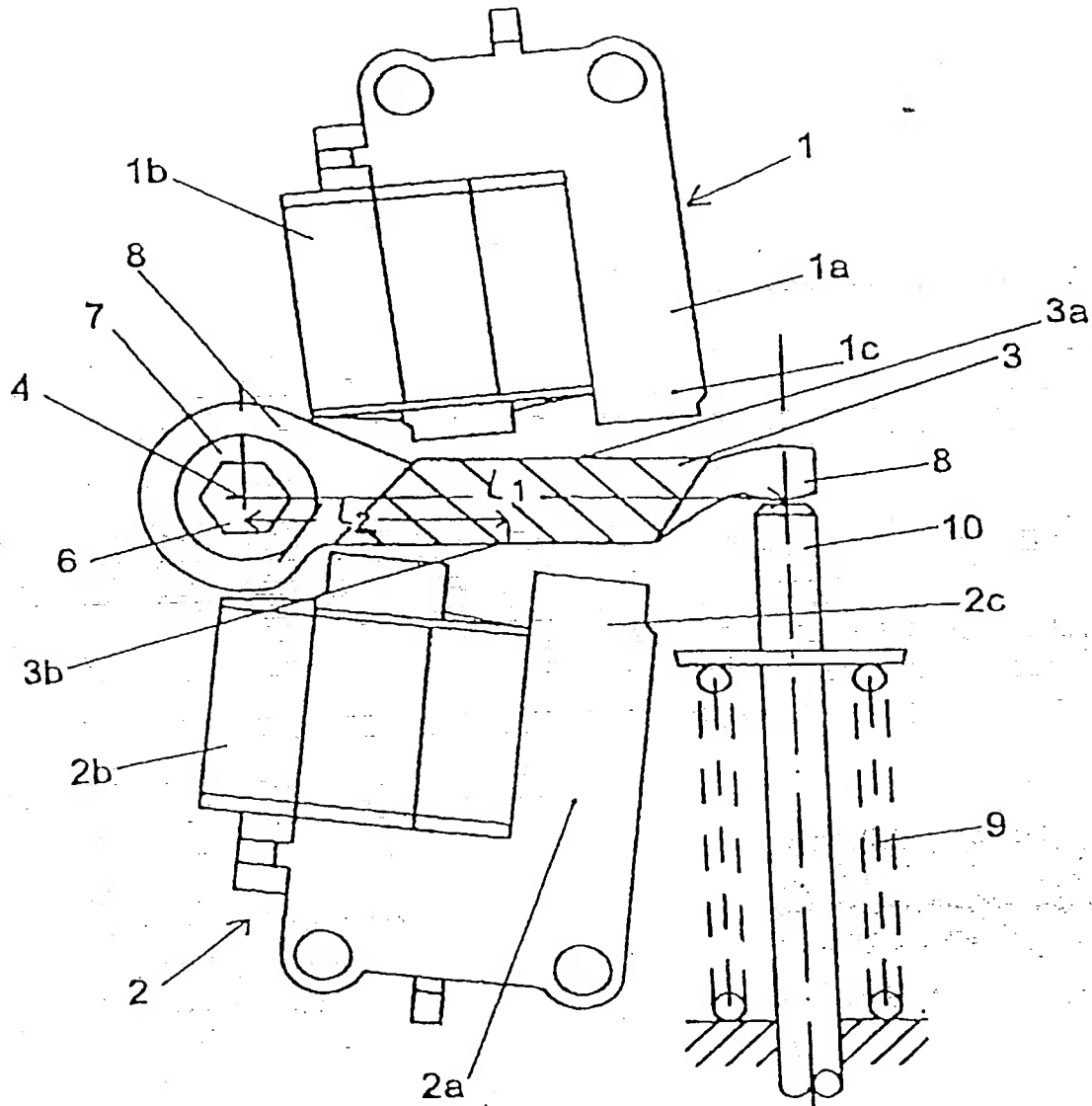


Fig. 1

2/2

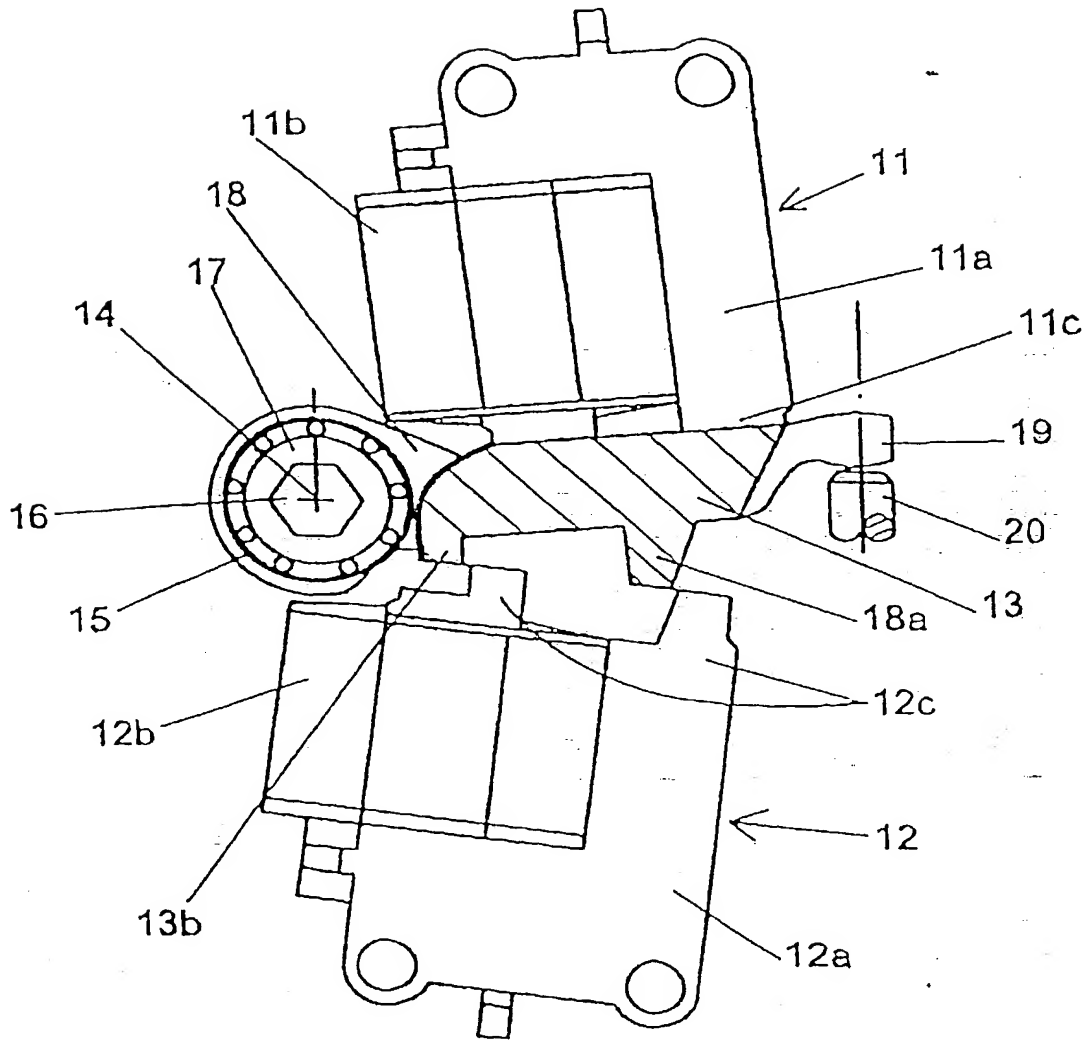


Fig. 2

10065573 111500

#S

PTO/SB/01 (02-01)

Approved for use through 10/31/2002. OMB 0631-0032

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☒ Declaration Submitted with Initial Filing
☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.18 (e)) required)

Attorney Docket Number	LEN-021020
First Named Inventor	Heinz Leiber et al.
COMPLETE IF KNOWN	
Application Number	10/088,893
Filing Date	3-19-02
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

ELECTROMAGNETIC ACTUATOR

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY)

09/15/2000

as United States Application Number or PCT International

Application Number PCT/EP00/09037 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
18945112.5	Germany	9/21/1999	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCT/EP00/09037	PCT	9/15/2000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority date sheet PTO/SB/02B attached hereto:

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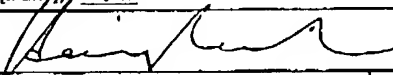
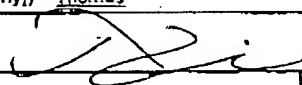
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.				
NAME OF SOLE OR FIRST INVENTOR:		<input type="checkbox"/> A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any]) <u>Heinz</u>		Family Name or Surname <u>Leiber</u>		
Inventor's Signature 		Date <u>15.03.02</u>		
Residence: City <u>Oberriexingen</u> <u>DEX</u>		State	Country <u>Germany</u>	Citizenship <u>Germany</u>
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NAME OF SECOND INVENTOR:		<input type="checkbox"/> A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any]) <u>Thomas</u>		Family Name or Surname <u>Leiber</u>		
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